

SEQUENCE LISTING

<110> Yanagi, Masayuki
Emerson, Suzanne
Bukh, Jens
Purcell, Robert

<120> Cloned Genome of Infectious Hepatitis C Viruses of
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<150> 60/137,693

<151> 1999-06-04

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Ala Gly Asn Lys Thr Leu Ala Gly Ser Arg Gly Pro Val Thr Gln Met
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Pro Val Glu Thr Leu Asp Ile Val Thr Arg Ser Pro Thr Phe Ser Asp
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His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Val Ala Tyr
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Thr Pro His Pro Asn Ile Glu Glu Val Ala Leu Gly Gln Glu Gly Glu			
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Ile Pro Phe Tyr Gly Arg Ala Ile Pro Leu Ser Tyr Ile Lys Gly Gly			
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Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala			
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Ala Ala Leu Arg Gly Met Gly Leu Asn Ser Val Ala Tyr Tyr Arg Gly			
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Leu Asp Val Ser Val Ile Pro Thr Gln Gly Asp Val Val Val Val Ala			
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Thr Asp Ala Leu Met Thr Gly Tyr Thr Gly Asp Phe Asp Ser Val Ile			
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Asp Cys Asn Val Ala Val Thr Gln Val Val Asp Phe Ser Leu Asp Pro			
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Thr Phe Thr Ile Thr Thr Gln Ile Val Pro Gln Asp Ala Val Ser Arg			
	1475	1480	1485
Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Leu Gly Ile Tyr Arg			
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Tyr Val Ser Thr Gly Glu Arg Ala Ser Gly Met Phe Asp Ser Val Val
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Ser Glu Thr Thr Val Arg Leu Arg Ala Tyr Phe Asn Thr Pro Gly Leu
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Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ala Val Phe Thr Gly
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Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly
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Glu Asn Phe Ala Tyr Leu Thr Ala Tyr Gln Ala Thr Val Cys Ala Arg
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Ala Lys Ala Pro Pro Pro Ser Trp Asp Val Met Trp Lys Cys Leu Thr
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Arg Leu Lys Pro Thr Leu Val Gly Pro Thr Pro Leu Leu Tyr Arg Leu
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Val Leu Ala Gly Gly Val Leu Ala Ala Val Ala Ala Tyr Cys Leu Ala
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Thr Gly Cys Val Cys Ile Ile Gly Arg Leu His Ile Asn Gln Arg Ala
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Val Val Ala Pro Asp Lys Glu Val Leu Tyr Glu Ala Phe Asp Glu Met
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Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Val Ala
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Ser Met Met Ala Phe Ser Ala Ala Leu Thr Ser Pro Leu Ser Thr Ser
1795 1800 1805

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Ala Pro Pro Ala Gly Ala Thr Gly Phe Val Val Ser Gly Leu Val Gly
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Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val Asp Ile Leu
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Ala Gly Tyr Gly Ala Gly Ile Ser Gly Ala Leu Val Ala Phe Lys Ile
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Met Ser Gly Glu Lys Pro Ser Met Glu Asp Val Val Asn Leu Leu Pro
1875 1880 1885

Gly Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Ile Cys Ala Ala
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Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met
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His Tyr Val Thr Glu Ser Asp Ala Ser Gln Arg Val Thr Gln Leu Leu
1940 1945 1950

Gly Ser Leu Thr Ile Thr Ser Leu Leu Arg Arg Leu His Asn Trp Ile
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Trp Asp Trp Val Cys Thr Ile Leu Thr Asp Phe Lys Asn Trp Leu Thr
1985 1990 1995 2000

Ser Lys Leu Phe Pro Lys Met Pro Gly Leu Pro Phe Val Ser Cys Gln
2005 2010 2015

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 gcagatcatg t 9611

<210> 4

<211> 3015

<212> PRT

<213> Hepatitis C virus

<400> 4

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Arg	Arg	Pro	Gln	Asp	Val	Lys	Phe	Pro	Gly	Gly	Gly	Gln	Ile	Val	Gly
			20						25					30	

Gly	Val	Tyr	Leu	Leu	Pro	Arg	Arg	Gly	Pro	Arg	Leu	Gly	Val	Arg	Ala
			35					40					45		

Thr	Arg	Lys	Thr	Ser	Glu	Arg	Ser	Gln	Pro	Arg	Gly	Arg	Arg	Gln	Pro
		50					55				60				

Ile	Pro	Lys	Asp	Arg	Arg	Ser	Thr	Gly	Lys	Ser	Trp	Gly	Lys	Pro	Gly
	65						70				75			80	

Tyr	Pro	Trp	Pro	Leu	Tyr	Gly	Asn	Glu	Gly	Leu	Gly	Trp	Ala	Gly	Trp
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

	85		90		95
Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro	100	105	110		
Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys	115	120	125		
Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu	130	135	140		
Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp	145	150	155	160	
Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile	165	170	175		
Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala	180	185	190		
Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr	195	200	205		
Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro	210	215	220		
Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile	225	230	235	240	
Pro Val Ser Pro Asn Val Ala Val Gln Arg Pro Gly Ala Leu Thr Gln	245	250	255		
Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys	260	265	270		
Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala	275	280	285		
Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys	290	295	300		
Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp	305	310	315	320	
Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr	325	330	335		
Ala Met Arg Val Pro Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His					

340	345	350
Trp Gly Val Met Phe Gly Leu Ala Tyr Phe Ser Met Gln Gly Ala Trp		
355	360	365
Ala Lys Val Val Val Ile Leu Leu Leu Ala Ala Gly Val Asp Ala Arg		
370	375	380
Thr His Thr Val Gly Gly Ser Ala Ala Gln Thr Thr Gly Arg Leu Thr		
385	390	395 400
Ser Leu Phe Asp Met Gly Pro Arg Gln Lys Ile Gln Leu Val Asn Thr		
405	410	415
Asn Gly Ser Trp His Ile Asn Arg Thr Ala Leu Asn Cys Asn Asp Ser		
420	425	430
Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn		
435	440	445
Ser Ser Gly Cys Pro Glu Arg Met Ser Ala Cys Arg Ser Ile Glu Ala		
450	455	460
Phe Arg Val Gly Trp Gly Ala Leu Gln Tyr Glu Asp Asn Val Thr Asn		
465	470	475 480
Pro Glu Asp Met Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Gln Cys		
485	490	495
Gly Val Val Ser Ala Lys Thr Val Cys Gly Pro Val Tyr Cys Phe Thr		
500	505	510
Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg Leu Gly Ala Pro Thr		
515	520	525
Tyr Thr Trp Gly Glu Asn Glu Thr Asp Val Phe Leu Leu Asn Ser Thr		
530	535	540
Arg Pro Pro Leu Gly Ser Trp Phe Gly Cys Thr Trp Met Asn Ser Ser		
545	550	555 560
Gly Tyr Thr Lys Thr Cys Gly Ala Pro Pro Cys Arg Thr Arg Ala Asp		
565	570	575
Phe Asn Ala Ser Thr Asp Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys		
580	585	590
His Pro Asp Thr Thr Tyr Leu Lys Cys Gly Ser Gly Pro Trp Leu Thr		

595	600	605
Pro Arg Cys Leu Ile Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys		
610	615	620
Thr Val Asn Tyr Thr Ile Phe Lys Ile Arg Met Tyr Val Gly Gly Val		
625	630	635 640
Glu His Arg Leu Thr Ala Ala Cys Asn Phe Thr Arg Gly Asp Arg Cys		
	645	650 655
Asn Leu Glu Asp Arg Asp Arg Ser Gln Leu Ser Pro Leu Leu His Ser		
	660	665 670
Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala		
	675	680 685
Leu Ser Thr Gly Leu Leu His Leu His Gln Asn Ile Val Asp Val Gln		
	690	695 700
Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp		
705	710	715 720
Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys		
	725	730 735
Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu		
	740	745 750
Glu Lys Leu Val Ile Leu His Ala Ala Ser Ala Ala Ser Cys Asn Gly		
	755	760 765
Phe Leu Tyr Phe Val Ile Phe Phe Val Ala Ala Trp Tyr Ile Lys Gly		
	770	775 780
Arg Val Val Pro Leu Ala Thr Tyr Ser Leu Thr Gly Leu Trp Ser Phe		
785	790	795 800
Ser Leu Leu Leu Leu Ala Leu Pro Gln Gln Ala Tyr Ala Leu Asp Thr		
	805	810 815
Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala		
	820	825 830
Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp		
	835	840 845
Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp		

850		855		860
Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu				
865		870		875 880
Met Cys Val Val His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu				
	885		890	895
Leu Ala Ile Phe Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys				
	900		905	910
Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu				
	915		920	925
Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys				
	930		935	940
Leu Gly Ala Leu Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu				
945		950		955 960
Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu				
	965		970	975
Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala				
	980		985	990
Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala				
	995		1000	1005
Arg Arg Gly Gln Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser				
1010		1015		1020
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr				
1025		1030		1035 1040
Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys				
	1045		1050	1055
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr				
	1060		1065	1070
Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly				
	1075		1080	1085
Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met				
1090		1095		1100
Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly				

1105	1110	1115	1120
Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu			
1125	1130	1135	
Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser			
1140	1145	1150	
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser			
1155	1160	1165	
Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe			
1170	1175	1180	
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile			
1185	1190	1195	1200
Pro Val Glu Asn Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp			
1205	1210	1215	
Asn Ser Ser Pro Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu			
1220	1225	1230	
His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr			
1235	1240	1245	
Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala			
1250	1255	1260	
Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro			
1265	1270	1275	1280
Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr			
1285	1290	1295	
Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly			
1300	1305	1310	
Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr			
1315	1320	1325	
Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly			
1330	1335	1340	
Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr			
1345	1350	1355	1360
Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu			

1365	1370	1375
Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly		
1380	1385	1390
Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala		
1395	1400	1405
Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly		
1410	1415	1420
Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser		
1425	1430	1435
Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile		
1445	1450	1455
Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro		
1460	1465	1470
Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg		
1475	1480	1485
Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg		
1490	1495	1500
Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val		
1505	1510	1515
Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro		
1525	1530	1535
Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu		
1540	1545	1550
Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly		
1555	1560	1565
Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly		
1570	1575	1580
Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg		
1585	1590	1595
Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile		
1605	1610	1615
Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu		

1620	1625	1630
Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr		
1635	1640	1645
Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp		
1650	1655	1660
Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser		
1665	1670	1675 1680
Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro		
1685	1690	1695
Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met		
1700	1705	1710
Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu		
1715	1720	1725
Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser		
1730	1735	1740
Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys		
1745	1750	1755 1760
Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile		
1765	1770	1775
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala		
1780	1785	1790
Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly		
1795	1800	1805
Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu		
1810	1815	1820
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly		
1825	1830	1835 1840
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu		
1845	1850	1855
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile		
1860	1865	1870
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro		

1875	1880	1885
Ala Ile Leu Ser Pro Gly	Ala Leu Val Val Gly	Val Val Cys Ala Ala
1890	1895	1900
Ile Leu Arg Arg His Val	Gly Pro Gly Glu Gly	Ala Val Gln Trp Met
1905	1910	1915 1920
Asn Arg Leu Ile Ala Phe	Ala Ser Arg Gly Asn	His Val Ser Pro Thr
1925	1930	1935
His Tyr Val Pro Glu Ser	Asp Ala Ala Ala Arg	Val Thr Ala Ile Leu
1940	1945	1950
Ser Ser Leu Thr Val Thr	Gln Leu Leu Arg Arg	Leu His Gln Trp Ile
1955	1960	1965
Ser Ser Glu Cys Thr Thr	Pro Cys Ser Gly Ser	Trp Leu Arg Asp Ile
1970	1975	1980
Trp Asp Trp Ile Cys Glu	Val Leu Ser Asp Phe	Lys Thr Trp Leu Lys
1985	1990	1995 2000
Ala Lys Leu Met Pro Gln	Leu Pro Gly Ile Pro	Phe Val Ser Cys Gln
2005	2010	2015
Arg Gly Tyr Arg Gly Val	Trp Arg Gly Asp Gly	Ile Met His Thr Arg
2020	2025	2030
Cys His Cys Gly Ala Glu	Ile Thr Gly His Val	Lys Asn Gly Thr Met
2035	2040	2045
Arg Ile Val Gly Pro Arg	Thr Cys Arg Asn Met	Trp Ser Gly Thr Phe
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Pro Ile Asn Ala Tyr Thr	Thr Gly Pro Cys Thr	Pro Leu Pro Ala Pro
2065	2070	2075 2080
Asn Tyr Lys Phe Ala Leu	Trp Arg Val Ser Ala	Glu Glu Tyr Val Glu
2085	2090	2095
Ile Arg Arg Val Gly Asp	Phe His Tyr Val Ser	Gly Met Thr Thr Asp
2100	2105	2110
Asn Leu Lys Cys Pro Cys	Gln Ile Pro Ser Pro	Glu Phe Phe Thr Glu
2115	2120	2125
Leu Asp Gly Val Arg Leu	His Arg Phe Ala Pro	Pro Cys Lys Pro Leu

2130	2135	2140
Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val		
2145	2150	2155 2160
Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr		
2165	2170	2175
Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg		
2180	2185	2190
Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser		
2195	2200	2205
Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp		
2210	2215	2220
Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu		
2225	2230	2235 2240
Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile		
2245	2250	2255
Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val		
2260	2265	2270
Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala		
2275	2280	2285
Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr		
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Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu		
2305	2310	2315 2320
Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr		
2325	2330	2335
Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala		
2340	2345	2350
Thr Lys Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn		
2355	2360	2365
Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser		
2370	2375	2380
Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly		

2385	2390	2395	2400
Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala			
2405	2410	2415	
Asp Thr Glu Asp Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly			
2420	2425	2430	
Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn			
2435	2440	2445	
Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr Ser Thr			
2450	2455	2460	
Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg			
2465	2470	2475	2480
Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys			
2485	2490	2495	
Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala			
2500	2505	2510	
Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly			
2515	2520	2525	
Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn			
2530	2535	2540	
Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr			
2545	2550	2555	2560
Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly			
2565	2570	2575	
Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg			
2580	2585	2590	
Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu			
2595	2600	2605	
Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg			
2610	2615	2620	
Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly			
2625	2630	2635	2640
Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp			

2645	2650	2655
Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln		
2660	2665	2670
Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly		
2675	2680	2685
Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg		
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Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr		
2705	2710	2715 2720
Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr		
2725	2730	2735
Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly		
2740	2745	2750
Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr		
2755	2760	2765
Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu		
2770	2775	2780
Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly		
2785	2790	2795 2800
Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu		
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Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly
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Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp
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Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala
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Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
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 Asn Leu Glu Asp Arg Asp Arg Ser Gln Leu Ser Pro Leu Leu His Ser
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 Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala
 675 680 685
 Leu Ser Thr Gly Leu Leu His Leu His Gln Asn Ile Val Asp Val Gln
 690 695 700
 Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp
 705 710 715 720
 Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys
 725 730 735

Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu	740	745	750
Glu Asn Leu Val Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly	755	760	765
Leu Val Ser Phe Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly	770	775	780
Arg Trp Val Pro Gly Ala Val Tyr Ala Leu Tyr Gly Met Trp Pro Leu	785	790	795 800
Leu Leu Leu Leu Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr	805	810	815
Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala	820	825	830
Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp	835	840	845
Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp	850	855	860
Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu	865	870	875 880
Met Cys Val Val His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu	885	890	895
Leu Ala Ile Phe Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys	900	905	910
Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu	915	920	925
Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys	930	935	940
Leu Gly Ala Leu Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu	945	950	955 960
Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu	965	970	975
Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala	980	985	990

Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala			
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Arg Arg Gly Gln Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser			
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Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr			
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Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys			
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Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr			
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Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly			
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Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met			
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Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly			
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Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu			
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Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser			
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Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser			
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Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe			
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Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile			
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Pro Val Glu Asn Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp			
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Asn Ser Ser Pro Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu			
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His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr			
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Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro
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 1285 1290 1295

Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly
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Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr
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Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly
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Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr
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Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu
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Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly
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Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala
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Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly
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Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser
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Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile
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Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro
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Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg
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Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg
 1490 1495 1500

Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val			
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Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro			
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Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu			
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Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly			
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Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly			
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Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg			
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Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile			
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Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu			
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Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr			
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Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp			
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Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys			
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Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile	1765	1770	1775
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala	1780	1785	1790
Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly	1795	1800	1805
Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu	1810	1815	1820
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly	1825	1830	1835
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu	1845	1850	1855
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile	1860	1865	1870
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro	1875	1880	1885
Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala	1890	1895	1900
Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met	1905	1910	1915
Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr	1925	1930	1935
His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu	1940	1945	1950
Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile	1955	1960	1965
Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile	1970	1975	1980
Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys	1985	1990	1995
Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln	2005	2010	2015

Arg Gly Tyr Arg Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg
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Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met
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Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe
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Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro
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Asn Tyr Lys Phe Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu
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Ile Arg Arg Val Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp
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Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu
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Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr
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Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg
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Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser
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Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp
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Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu
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Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile
2245 2250 2255

Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val
2260 2265 2270

Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala
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Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr
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Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu
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Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr
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Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly
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Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly
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Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn			
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Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr			
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Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile
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Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg
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<211> 9611

<212> DNA

<213> Hepatitis C virus

<400> 7

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<210> 8

<211> 3015

<212> PRT

<213> Hepatitis C virus

<400> 8

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Arg Arg Pro Gln Asp Val Lys Phe Pro Gly Gly Gly Gln Ile Val Gly
 20 25 30

Gly Val Tyr Leu Leu Pro Arg Arg Gly Pro Arg Leu Gly Val Arg Ala
 35 40 45

Thr Arg Lys Thr Ser Glu Arg Ser Gln Pro Arg Gly Arg Arg Gln Pro
 50 55 60

Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro Gly
 65 70 75 80

Tyr Pro Trp Pro Leu Tyr Gly Asn Glu Gly Leu Gly Trp Ala Gly Trp
 85 90 95

Leu Leu Ser Pro Arg Gly Ser Arg Pro Ser Trp Gly Pro Asn Asp Pro
 100 105 110

Arg His Arg Ser Arg Asn Val Gly Lys Val Ile Asp Thr Leu Thr Cys
 115 120 125

Gly Phe Ala Asp Leu Met Gly Tyr Ile Pro Val Val Gly Ala Pro Leu
 130 135 140

Gly Gly Val Ala Arg Ala Leu Ala His Gly Val Arg Val Leu Glu Asp
 145 150 155 160

Gly Val Asn Phe Ala Thr Gly Asn Leu Pro Gly Cys Ser Phe Ser Ile
 165 170 175

Phe Leu Leu Ala Leu Leu Ser Cys Ile Thr Thr Pro Val Ser Ala Ala
 180 185 190

Glu Val Lys Asn Ile Ser Thr Gly Tyr Met Val Thr Asn Asp Cys Thr
 195 200 205

Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
 210 215 220

Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile
 225 230 235 240

Pro Val Ser Pro Asn Val Ala Val Gln Arg Pro Gly Ala Leu Thr Gln
 245 250 255

Gly Leu Arg Thr His Ile Asp Met Val Val Met Ser Ala Thr Leu Cys
 260 265 270

Ser Ala Leu Tyr Val Gly Asp Leu Cys Gly Gly Val Met Leu Ala Ala
 275 280 285

Gln Met Phe Ile Val Ser Pro Gln His His Trp Phe Val Gln Asp Cys
 290 295 300

Asn Cys Ser Ile Tyr Pro Gly Thr Ile Thr Gly His Arg Met Ala Trp
 305 310 315 320

Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr
 325 330 335

Ala Met Arg Val Pro Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His
 340 345 350

Trp	Gly	Val	Met	Phe	Gly	Leu	Ala	Tyr	Phe	Ser	Met	Gln	Gly	Ala	Trp	355	360	365	
Ala	Lys	Val	Val	Val	Ile	Leu	Leu	Leu	Ala	Ala	Gly	Val	Asp	Ala	Arg	370	375	380	
Thr	His	Thr	Val	Gly	Gly	Ser	Ala	Ala	Gln	Thr	Thr	Gly	Arg	Leu	Thr	385	390	395	400
Ser	Leu	Phe	Asp	Met	Gly	Pro	Arg	Gln	Lys	Ile	Gln	Leu	Val	Asn	Thr	405	410	415	
Asn	Gly	Ser	Trp	His	Ile	Asn	Arg	Thr	Ala	Leu	Asn	Cys	Asn	Asp	Ser	420	425	430	
Leu	His	Thr	Gly	Phe	Ile	Ala	Ser	Leu	Phe	Tyr	Thr	His	Ser	Phe	Asn	435	440	445	
Ser	Ser	Gly	Cys	Pro	Glu	Arg	Met	Ser	Ala	Cys	Arg	Ser	Ile	Glu	Ala	450	455	460	
Phe	Arg	Val	Gly	Trp	Gly	Ala	Leu	Gln	Tyr	Glu	Asp	Asn	Val	Thr	Asn	465	470	475	480
Pro	Glu	Asp	Met	Arg	Pro	Tyr	Cys	Trp	His	Tyr	Pro	Pro	Arg	Gln	Cys	485	490	495	
Gly	Val	Val	Ser	Ala	Lys	Thr	Val	Cys	Gly	Pro	Val	Tyr	Cys	Phe	Thr	500	505	510	
Pro	Ser	Pro	Val	Val	Val	Gly	Thr	Thr	Asp	Arg	Leu	Gly	Ala	Pro	Thr	515	520	525	
Tyr	Thr	Trp	Gly	Glu	Asn	Glu	Thr	Asp	Val	Phe	Leu	Leu	Asn	Ser	Thr	530	535	540	
Arg	Pro	Pro	Leu	Gly	Ser	Trp	Phe	Gly	Cys	Thr	Trp	Met	Asn	Ser	Ser	545	550	555	560
Gly	Tyr	Thr	Lys	Thr	Cys	Gly	Ala	Pro	Pro	Cys	Arg	Thr	Arg	Ala	Asp	565	570	575	
Phe	Asn	Ala	Ser	Thr	Asp	Leu	Leu	Cys	Pro	Thr	Asp	Cys	Phe	Arg	Lys	580	585	590	
His	Pro	Asp	Thr	Thr	Tyr	Leu	Lys	Cys	Gly	Ser	Gly	Pro	Trp	Leu	Thr	595	600	605	

Pro	Arg	Cys	Leu	Ile	Asp	Tyr	Pro	Tyr	Arg	Leu	Trp	His	Tyr	Pro	Cys	610	615	620	
Thr	Val	Asn	Tyr	Thr	Ile	Phe	Lys	Ile	Arg	Met	Tyr	Val	Gly	Gly	Val	625	630	635	640
Glu	His	Arg	Leu	Thr	Ala	Ala	Cys	Asn	Phe	Thr	Arg	Gly	Asp	Arg	Cys	645	650	655	
Asn	Leu	Glu	Asp	Arg	Asp	Arg	Ser	Gln	Leu	Ser	Pro	Leu	Leu	His	Ser	660	665	670	
Thr	Thr	Glu	Trp	Ala	Ile	Leu	Pro	Cys	Ser	Tyr	Ser	Asp	Leu	Pro	Ala	675	680	685	
Leu	Ser	Thr	Gly	Leu	Leu	His	Leu	His	Gln	Asn	Ile	Val	Asp	Val	Gln	690	695	700	
Phe	Met	Tyr	Gly	Leu	Ser	Pro	Ala	Leu	Thr	Lys	Tyr	Ile	Val	Arg	Trp	705	710	715	720
Glu	Trp	Val	Ile	Leu	Leu	Phe	Leu	Leu	Leu	Ala	Asp	Ala	Arg	Val	Cys	725	730	735	
Ala	Cys	Leu	Trp	Met	Leu	Ile	Leu	Leu	Gly	Gln	Ala	Glu	Ala	Ala	Leu	740	745	750	
Glu	Lys	Leu	Val	Ile	Leu	His	Ala	Ala	Ser	Ala	Ala	Ser	Cys	Asn	Gly	755	760	765	
Phe	Leu	Tyr	Phe	Val	Ile	Phe	Phe	Val	Ala	Ala	Trp	Tyr	Ile	Lys	Gly	770	775	780	
Arg	Val	Val	Pro	Leu	Ala	Thr	Tyr	Ser	Leu	Thr	Gly	Leu	Trp	Ser	Phe	785	790	795	800
Ser	Leu	Leu	Leu	Leu	Ala	Leu	Pro	Gln	Gln	Ala	Tyr	Ala	Leu	Asp	Thr	805	810	815	
Glu	Val	Ala	Ala	Ser	Cys	Gly	Gly	Val	Val	Leu	Val	Gly	Leu	Met	Ala	820	825	830	
Leu	Thr	Leu	Ser	Pro	Tyr	Tyr	Lys	Arg	Tyr	Ile	Ser	Trp	Cys	Met	Trp	835	840	845	
Trp	Leu	Gln	Tyr	Phe	Leu	Thr	Arg	Val	Glu	Ala	Gln	Leu	His	Val	Trp	850	855	860	

Val	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	Ile	Leu	Leu	865	870	875	880
Met	Cys	Val	Val	His	Pro	Thr	Leu	Val	Phe	Asp	Ile	Thr	Lys	Leu	Leu	885	890	895	
Leu	Ala	Ile	Phe	Gly	Pro	Leu	Trp	Ile	Leu	Gln	Ala	Ser	Leu	Leu	Lys	900	905	910	
Val	Pro	Tyr	Phe	Val	Arg	Val	Gln	Gly	Leu	Leu	Arg	Ile	Cys	Ala	Leu	915	920	925	
Ala	Arg	Lys	Ile	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	Ile	Ile	Lys	930	935	940	
Leu	Gly	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asn	His	Leu	Thr	Pro	Leu	945	950	955	960
Arg	Asp	Trp	Ala	His	Asn	Gly	Leu	Arg	Asp	Leu	Ala	Val	Ala	Val	Glu	965	970	975	
Pro	Val	Val	Phe	Ser	Arg	Met	Glu	Thr	Lys	Leu	Ile	Thr	Trp	Gly	Ala	980	985	990	
Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Asn	Gly	Leu	Pro	Val	Ser	Ala	995	1000	1005	
Arg	Arg	Gly	Gln	Glu	Ile	Leu	Leu	Gly	Pro	Ala	Asp	Gly	Met	Val	Ser	1010	1015	1020	
Lys	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ala	Gln	Gln	Thr	1025	1030	1035	1040
Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	Arg	Asp	Lys	1045	1050	1055	
Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Ile	Val	Ser	Thr	Ala	Thr	Gln	Thr	1060	1065	1070	
Phe	Leu	Ala	Thr	Cys	Ile	Asn	Gly	Val	Cys	Trp	Thr	Val	Tyr	His	Gly	1075	1080	1085	
Ala	Gly	Thr	Arg	Thr	Ile	Ala	Ser	Pro	Lys	Gly	Pro	Val	Ile	Gln	Met	1090	1095	1100	
Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Pro	Ala	Pro	Gln	Gly	1105	1110	1115	1120

Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu	1125	1130	1135
Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser	1140	1145	1150
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser	1155	1160	1165
Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe	1170	1175	1180
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile	1185	1190	1195
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Pro Val Glu Asn Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp	1205	1210	1215
Asn Ser Ser Pro Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu	1220	1225	1230
His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr	1235	1240	1245
Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala	1250	1255	1260
Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro	1265	1270	1275
			1280
Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr	1285	1290	1295
Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly	1300	1305	1310
Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr	1315	1320	1325
Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly	1330	1335	1340
Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr	1345	1350	1355
			1360
Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu	1365	1370	1375

Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly	1380	1385	1390
Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala	1395	1400	1405
Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly	1410	1415	1420
Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser	1425	1430	1435 1440
Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile	1445	1450	1455
Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro	1460	1465	1470
Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg	1475	1480	1485
Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg	1490	1495	1500
Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val	1505	1510	1515 1520
Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro	1525	1530	1535
Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu	1540	1545	1550
Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly	1555	1560	1565
Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly	1570	1575	1580
Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg	1585	1590	1595 1600
Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile	1605	1610	1615
Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu	1620	1625	1630

Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr			
1635	1640	1645	
Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp			
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Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser			
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Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro			
1685	1690	1695	
Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met			
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Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu			
1715	1720	1725	
Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser			
1730	1735	1740	
Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys			
1745	1750	1755	1760
Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile			
1765	1770	1775	
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala			
1780	1785	1790	
Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly			
1795	1800	1805	
Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu			
1810	1815	1820	
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly			
1825	1830	1835	1840
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu			
1845	1850	1855	
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile			
1860	1865	1870	
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro			
1875	1880	1885	

Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala			
1890	1895	1900	
Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met			
1905	1910	1915	1920
Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr			
1925	1930	1935	
His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu			
1940	1945	1950	
Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile			
1955	1960	1965	
Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile			
1970	1975	1980	
Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys			
1985	1990	1995	2000
Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln			
2005	2010	2015	
Arg Gly Tyr Arg Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg			
2020	2025	2030	
Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met			
2035	2040	2045	
Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe			
2050	2055	2060	
Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro			
2065	2070	2075	2080
Asn Tyr Lys Phe Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu			
2085	2090	2095	
Ile Arg Arg Val Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp			
2100	2105	2110	
Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu			
2115	2120	2125	
Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro Cys Lys Pro Leu			
2130	2135	2140	

Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val
 2145 2150 2155 2160

Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr
 2165 2170 2175

Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg
 2180 2185 2190

Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser
 2195 2200 2205

Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp
 2210 2215 2220

Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu
 2225 2230 2235 2240

Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile
 2245 2250 2255

Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val
 2260 2265 2270

Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala
 2275 2280 2285

Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr
 2290 2295 2300

Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu
 2305 2310 2315 2320

Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr
 2325 2330 2335

Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala
 2340 2345 2350

Thr Lys Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn
 2355 2360 2365

Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser
 2370 2375 2380

Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly
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Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala	2405	2410	2415
Asp Thr Glu Asp Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly	2420	2425	2430
Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn	2435	2440	2445
Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr Ser Thr	2450	2455	2460
Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg	2465	2470	2475
Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys	2485	2490	2495
Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala	2500	2505	2510
Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly	2515	2520	2525
Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn	2530	2535	2540
Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr	2545	2550	2555
Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly	2565	2570	2575
Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg	2580	2585	2590
Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu	2595	2600	2605
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Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp	2645	2650	2655

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Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly	2675	2680	2685
Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg	2690	2695	2700
Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr	2705	2710	2715 2720
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Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu	2770	2775	2780
Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly	2785	2790	2795 2800
Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu	2805	2810	2815
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Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu	2850	2855	2860
Gln Ala Leu Asn Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro	2865	2870	2875 2880
Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe	2885	2890	2895
Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys	2900	2905	2910

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Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg
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Ile Tyr Leu Leu Pro Asn Arg
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Asn Asp Ser Ile Thr Trp Gln Leu Gln Ala Ala Val Leu His Val Pro
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Gly Cys Val Pro Cys Glu Lys Val Gly Asn Ala Ser Gln Cys Trp Ile

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Asp Met Met Met Asn Trp Ser Pro Thr Ala Thr Met Ile Leu Ala Tyr						
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Ala Met Arg Val Pro Glu Val Ile Ile Asp Ile Ile Ser Gly Ala His						
	340		345		350	
Trp Gly Val Met Phe Gly Leu Ala Tyr Phe Ser Met Gln Gly Ala Trp						
	355		360		365	
Ala Lys Val Val Val Ile Leu Leu Leu Ala Ala Gly Val Asp Ala Arg						
	370		375		380	
Thr His Thr Val Gly Gly Ser Ala Ala Gln Thr Thr Gly Arg Leu Thr						
	385		390		395	400
Ser Leu Phe Asp Met Gly Pro Arg Gln Lys Ile Gln Leu Val Asn Thr						
	405		410		415	
Asn Gly Ser Trp His Ile Asn Arg Thr Ala Leu Asn Cys Asn Asp Ser						
	420		425		430	
Leu His Thr Gly Phe Ile Ala Ser Leu Phe Tyr Thr His Ser Phe Asn						
	435		440		445	
Ser Ser Gly Cys Pro Glu Arg Met Ser Ala Cys Arg Ser Ile Glu Ala						
	450		455		460	
Phe Arg Val Gly Trp Gly Ala Leu Gln Tyr Glu Asp Asn Val Thr Asn						
	465		470		475	480
Pro Glu Asp Met Arg Pro Tyr Cys Trp His Tyr Pro Pro Arg Gln Cys						

485	490	495
Gly Val Val Ser Ala Lys Thr Val Cys Gly Pro Val Tyr Cys Phe Thr		
500	505	510
Pro Ser Pro Val Val Val Gly Thr Thr Asp Arg Leu Gly Ala Pro Thr		
515	520	525
Tyr Thr Trp Gly Glu Asn Glu Thr Asp Val Phe Leu Leu Asn Ser Thr		
530	535	540
Arg Pro Pro Leu Gly Ser Trp Phe Gly Cys Thr Trp Met Asn Ser Ser		
545	550	555
		560
Gly Tyr Thr Lys Thr Cys Gly Ala Pro Pro Cys Arg Thr Arg Ala Asp		
565	570	575
Phe Asn Ala Ser Thr Asp Leu Leu Cys Pro Thr Asp Cys Phe Arg Lys		
580	585	590
His Pro Asp Thr Thr Tyr Leu Lys Cys Gly Ser Gly Pro Trp Leu Thr		
595	600	605
Pro Arg Cys Leu Ile Asp Tyr Pro Tyr Arg Leu Trp His Tyr Pro Cys		
610	615	620
Thr Val Asn Tyr Thr Ile Phe Lys Ile Arg Met Tyr Val Gly Gly Val		
625	630	635
		640
Glu His Arg Leu Thr Ala Ala Cys Asn Phe Thr Arg Gly Asp Arg Cys		
645	650	655
Asn Leu Glu Asp Arg Asp Arg Ser Gln Leu Ser Pro Leu Leu His Ser		
660	665	670
Thr Thr Glu Trp Ala Ile Leu Pro Cys Ser Tyr Ser Asp Leu Pro Ala		
675	680	685
Leu Ser Thr Gly Leu Leu His Leu His Gln Asn Ile Val Asp Val Gln		
690	695	700
Phe Met Tyr Gly Leu Ser Pro Ala Leu Thr Lys Tyr Ile Val Arg Trp		
705	710	715
		720
Glu Trp Val Ile Leu Leu Phe Leu Leu Leu Ala Asp Ala Arg Val Cys		
725	730	735
Ala Cys Leu Trp Met Leu Ile Leu Leu Gly Gln Ala Glu Ala Ala Leu		

740	745	750
Glu Asn Leu Val Ile Leu Asn Ala Ala Ser Leu Ala Gly Thr His Gly		
755	760	765
Leu Val Ser Phe Leu Val Phe Phe Cys Phe Ala Trp Tyr Leu Lys Gly		
770	775	780
Arg Trp Val Pro Gly Ala Val Tyr Ala Leu Tyr Gly Met Trp Pro Leu		
785	790	795 800
Leu Leu Leu Leu Leu Ala Leu Pro Gln Arg Ala Tyr Ala Leu Asp Thr		
805	810	815
Glu Val Ala Ala Ser Cys Gly Gly Val Val Leu Val Gly Leu Met Ala		
820	825	830
Leu Thr Leu Ser Pro Tyr Tyr Lys Arg Tyr Ile Ser Trp Cys Met Trp		
835	840	845
Trp Leu Gln Tyr Phe Leu Thr Arg Val Glu Ala Gln Leu His Val Trp		
850	855	860
Val Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val Ile Leu Leu		
865	870	875 880
Met Cys Val Val His Pro Thr Leu Val Phe Asp Ile Thr Lys Leu Leu		
885	890	895
Leu Ala Ile Phe Gly Pro Leu Trp Ile Leu Gln Ala Ser Leu Leu Lys		
900	905	910
Val Pro Tyr Phe Val Arg Val Gln Gly Leu Leu Arg Ile Cys Ala Leu		
915	920	925
Ala Arg Lys Ile Ala Gly Gly His Tyr Val Gln Met Ala Ile Ile Lys		
930	935	940
Leu Gly Ala Leu Thr Gly Thr Tyr Val Tyr Asn His Leu Thr Pro Leu		
945	950	955 960
Arg Asp Trp Ala His Asn Gly Leu Arg Asp Leu Ala Val Ala Val Glu		
965	970	975
Pro Val Val Phe Ser Arg Met Glu Thr Lys Leu Ile Thr Trp Gly Ala		
980	985	990
Asp Thr Ala Ala Cys Gly Asp Ile Ile Asn Gly Leu Pro Val Ser Ala		

995	1000	1005
Arg Arg Gly Gln Glu Ile Leu Leu Gly Pro Ala Asp Gly Met Val Ser		
1010	1015	1020
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ala Gln Gln Thr		
1025	1030	1035 1040
Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys		
1045	1050	1055
Asn Gln Val Glu Gly Glu Val Gln Ile Val Ser Thr Ala Thr Gln Thr		
1060	1065	1070
Phe Leu Ala Thr Cys Ile Asn Gly Val Cys Trp Thr Val Tyr His Gly		
1075	1080	1085
Ala Gly Thr Arg Thr Ile Ala Ser Pro Lys Gly Pro Val Ile Gln Met		
1090	1095	1100
Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Pro Ala Pro Gln Gly		
1105	1110	1115 1120
Ser Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu		
1125	1130	1135
Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser		
1140	1145	1150
Arg Gly Ser Leu Leu Ser Pro Arg Pro Ile Ser Tyr Leu Lys Gly Ser		
1155	1160	1165
Ser Gly Gly Pro Leu Leu Cys Pro Ala Gly His Ala Val Gly Leu Phe		
1170	1175	1180
Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile		
1185	1190	1195 1200
Pro Val Glu Asn Leu Gly Thr Thr Met Arg Ser Pro Val Phe Thr Asp		
1205	1210	1215
Asn Ser Ser Pro Pro Ala Val Pro Gln Ser Phe Gln Val Ala His Leu		
1220	1225	1230
His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro Ala Ala Tyr		
1235	1240	1245
Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser Val Ala Ala		

1250	1255	1260
Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly Val Asp Pro		
1265	1270	1275 1280
Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ser Pro Ile Thr		
1285	1290	1295
Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys Ser Gly Gly		
1300	1305	1310
Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr Asp Ala Thr		
1315	1320	1325
Ser Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu Thr Ala Gly		
1330	1335	1340
Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly Ser Val Thr		
1345	1350	1355 1360
Val Ser His Pro Asn Ile Glu Glu Val Ala Leu Ser Thr Thr Gly Glu		
1365	1370	1375
Ile Pro Phe Tyr Gly Lys Ala Ile Pro Leu Glu Val Ile Lys Gly Gly		
1380	1385	1390
Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp Glu Leu Ala		
1395	1400	1405
Ala Lys Leu Val Ala Leu Gly Ile Asn Ala Val Ala Tyr Tyr Arg Gly		
1410	1415	1420
Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Val Val Val Ser		
1425	1430	1435 1440
Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp Ser Val Ile		
1445	1450	1455
Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser Leu Asp Pro		
1460	1465	1470
Thr Phe Thr Ile Glu Thr Thr Thr Leu Pro Gln Asp Ala Val Ser Arg		
1475	1480	1485
Thr Gln Arg Arg Gly Arg Thr Gly Arg Gly Lys Pro Gly Ile Tyr Arg		
1490	1495	1500
Phe Val Ala Pro Gly Glu Arg Pro Ser Gly Met Phe Asp Ser Ser Val		

1505	1510	1515	1520
Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu Leu Thr Pro			
1525	1530	1535	
Ala Glu Thr Thr Val Arg Leu Arg Ala Tyr Met Asn Thr Pro Gly Leu			
1540	1545	1550	
Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val Phe Thr Gly			
1555	1560	1565	
Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys Gln Ser Gly			
1570	1575	1580	
Glu Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val Cys Ala Arg			
1585	1590	1595	1600
Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys Cys Leu Ile			
1605	1610	1615	
Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu Tyr Arg Leu			
1620	1625	1630	
Gly Ala Val Gln Asn Glu Val Thr Leu Thr His Pro Ile Thr Lys Tyr			
1635	1640	1645	
Ile Met Thr Cys Met Ser Ala Asp Leu Glu Val Val Thr Ser Thr Trp			
1650	1655	1660	
Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr Cys Leu Ser			
1665	1670	1675	1680
Thr Gly Cys Val Val Ile Val Gly Arg Ile Val Leu Ser Gly Lys Pro			
1685	1690	1695	
Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Gln Glu Phe Asp Glu Met			
1700	1705	1710	
Glu Glu Cys Ser Gln His Leu Pro Tyr Ile Glu Gln Gly Met Met Leu			
1715	1720	1725	
Ala Glu Gln Phe Lys Gln Lys Ala Leu Gly Leu Leu Gln Thr Ala Ser			
1730	1735	1740	
Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn Trp Gln Lys			
1745	1750	1755	1760
Leu Glu Val Phe Trp Ala Lys His Met Trp Asn Phe Ile Ser Gly Ile			

1765	1770	1775
Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro Ala Ile Ala		
1780	1785	1790
Ser Leu Met Ala Phe Thr Ala Ala Val Thr Ser Pro Leu Thr Thr Gly		
1795	1800	1805
Gln Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala Ala Gln Leu		
1810	1815	1820
Ala Ala Pro Gly Ala Ala Thr Ala Phe Val Gly Ala Gly Leu Ala Gly		
1825	1830	1835 1840
Ala Ala Ile Gly Ser Val Gly Leu Gly Lys Val Leu Val Asp Ile Leu		
1845	1850	1855
Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala Phe Lys Ile		
1860	1865	1870
Met Ser Gly Glu Val Pro Ser Thr Glu Asp Leu Val Asn Leu Leu Pro		
1875	1880	1885
Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val Cys Ala Ala		
1890	1895	1900
Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val Gln Trp Met		
1905	1910	1915 1920
Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val Ser Pro Thr		
1925	1930	1935
His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr Ala Ile Leu		
1940	1945	1950
Ser Ser Leu Thr Val Thr Gln Leu Leu Arg Arg Leu His Gln Trp Ile		
1955	1960	1965
Ser Ser Glu Cys Thr Thr Pro Cys Ser Gly Ser Trp Leu Arg Asp Ile		
1970	1975	1980
Trp Asp Trp Ile Cys Glu Val Leu Ser Asp Phe Lys Thr Trp Leu Lys		
1985	1990	1995 2000
Ala Lys Leu Met Pro Gln Leu Pro Gly Ile Pro Phe Val Ser Cys Gln		
2005	2010	2015
Arg Gly Tyr Arg Gly Val Trp Arg Gly Asp Gly Ile Met His Thr Arg		

2020	2025	2030
Cys His Cys Gly Ala Glu Ile Thr Gly His Val Lys Asn Gly Thr Met 2035	2040	2045
Arg Ile Val Gly Pro Arg Thr Cys Arg Asn Met Trp Ser Gly Thr Phe 2050	2055	2060
Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Leu Pro Ala Pro 2065	2070	2075 2080
Asn Tyr Lys Phe Ala Leu Trp Arg Val Ser Ala Glu Glu Tyr Val Glu 2085	2090	2095
Ile Arg Arg Val Gly Asp Phe His Tyr Val Ser Gly Met Thr Thr Asp 2100	2105	2110
Asn Leu Lys Cys Pro Cys Gln Ile Pro Ser Pro Glu Phe Phe Thr Glu 2115	2120	2125
Leu Asp Gly Val Arg Leu His Arg Phe Ala Pro Pro Cys Lys Pro Leu 2130	2135	2140
Leu Arg Glu Glu Val Ser Phe Arg Val Gly Leu His Glu Tyr Pro Val 2145	2150	2155 2160
Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala Val Leu Thr 2165	2170	2175
Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Ala Ala Gly Arg 2180	2185	2190
Arg Leu Ala Arg Gly Ser Pro Pro Ser Met Ala Ser Ser Ser Ala Ser 2195	2200	2205
Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Ala Asn His Asp 2210	2215	2220
Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu Trp Arg Gln Glu 2225	2230	2235 2240
Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys Val Val Ile 2245	2250	2255
Leu Asp Ser Phe Asp Pro Leu Val Ala Glu Glu Asp Glu Arg Glu Val 2260	2265	2270
Ser Val Pro Ala Glu Ile Leu Arg Lys Ser Arg Arg Phe Ala Arg Ala		

2275	2280	2285
Leu Pro Val Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu Val Glu Thr		
2290	2295	2300
Trp Lys Lys Pro Asp Tyr Glu Pro Pro Val Val His Gly Cys Pro Leu		
2305	2310	2315 2320
Pro Pro Pro Arg Ser Pro Pro Val Pro Pro Pro Arg Lys Lys Arg Thr		
2325	2330	2335
Val Val Leu Thr Glu Ser Thr Leu Ser Thr Ala Leu Ala Glu Leu Ala		
2340	2345	2350
Thr Lys Ser Phe Gly Ser Ser Ser Thr Ser Gly Ile Thr Gly Asp Asn		
2355	2360	2365
Thr Thr Thr Ser Ser Glu Pro Ala Pro Ser Gly Cys Pro Pro Asp Ser		
2370	2375	2380
Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly Glu Pro Gly		
2385	2390	2395 2400
Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser Ser Gly Ala		
2405	2410	2415
Asp Thr Glu Asp Val Val Cys Cys Ser Met Ser Tyr Ser Trp Thr Gly		
2420	2425	2430
Ala Leu Val Thr Pro Cys Ala Ala Glu Glu Gln Lys Leu Pro Ile Asn		
2435	2440	2445
Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr Ser Thr		
2450	2455	2460
Thr Ser Arg Ser Ala Cys Gln Arg Gln Lys Lys Val Thr Phe Asp Arg		
2465	2470	2475 2480
Leu Gln Val Leu Asp Ser His Tyr Gln Asp Val Leu Lys Glu Val Lys		
2485	2490	2495
Ala Ala Ala Ser Lys Val Lys Ala Asn Leu Leu Ser Val Glu Glu Ala		
2500	2505	2510
Cys Ser Leu Thr Pro Pro His Ser Ala Lys Ser Lys Phe Gly Tyr Gly		
2515	2520	2525
Ala Lys Asp Val Arg Cys His Ala Arg Lys Ala Val Ala His Ile Asn		

2530	2535	2540
Ser Val Trp Lys Asp Leu Leu Glu Asp Ser Val Thr Pro Ile Asp Thr		
2545	2550	2555 2560
Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu Lys Gly		
2565	2570	2575
Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly Val Arg		
2580	2585	2590
Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Lys Leu Pro Leu		
2595	2600	2605
Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly Gln Arg		
2610	2615	2620
Val Glu Phe Leu Val Gln Ala Trp Lys Ser Lys Lys Thr Pro Met Gly		
2625	2630	2635 2640
Phe Ser Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu Ser Asp		
2645	2650	2655
Ile Arg Thr Glu Glu Ala Ile Tyr Gln Cys Cys Asp Leu Asp Pro Gln		
2660	2665	2670
Ala Arg Val Ala Ile Lys Ser Leu Thr Glu Arg Leu Tyr Val Gly Gly		
2675	2680	2685
Pro Leu Thr Asn Ser Arg Gly Glu Asn Cys Gly Tyr Arg Arg Cys Arg		
2690	2695	2700
Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr Cys Tyr		
2705	2710	2715 2720
Ile Lys Ala Arg Ala Ala Cys Arg Ala Ala Gly Leu Gln Asp Cys Thr		
2725	2730	2735
Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser Ala Gly		
2740	2745	2750
Val Gln Glu Asp Ala Ala Ser Leu Arg Ala Phe Thr Glu Ala Met Thr		
2755	2760	2765
Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Gln Pro Glu Tyr Asp Leu		
2770	2775	2780
Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His Asp Gly		

2785	2790	2795	2800
Ala Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr Pro Leu			
2805	2810	2815	
Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn Ser Trp			
2820	2825	2830	
Leu Gly Asn Ile Ile Met Phe Ala Pro Thr Leu Trp Ala Arg Met Ile			
2835	2840	2845	
Leu Met Thr His Phe Phe Ser Val Leu Ile Ala Arg Asp Gln Leu Glu			
2850	2855	2860	
Gln Ala Leu Asn Cys Glu Ile Tyr Gly Ala Cys Tyr Ser Ile Glu Pro			
2865	2870	2875	2880
Leu Asp Leu Pro Pro Ile Ile Gln Arg Leu His Gly Leu Ser Ala Phe			
2885	2890	2895	
Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala Ala Cys			
2900	2905	2910	
Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Ala Trp Arg His Arg Ala			
2915	2920	2925	
Arg Ser Val Arg Ala Arg Leu Leu Ser Arg Gly Gly Arg Ala Ala Ile			
2930	2935	2940	
Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu Lys Leu			
2945	2950	2955	2960
Thr Pro Ile Ala Ala Ala Gly Arg Leu Asp Leu Ser Gly Trp Phe Thr			
2965	2970	2975	
Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Val Ser His Ala Arg			
2980	2985	2990	
Pro Arg Trp Phe Trp Phe Cys Leu Leu Leu Leu Ala Ala Gly Val Gly			
2995	3000	3005	
Ile Tyr Leu Leu Pro Asn Arg			
3010	3015		

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24

<210> 12

<211> 24

<212> DNA

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24

<210> 13

<211> 24

<212> DNA

<213> Hepatitis C virus

<400> 13

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24

<210> 14

<211> 22

<212> DNA

<213> Hepatitis C virus

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22

<210> 15

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<210> 20
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aatgc 65

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26

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23

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<400> 30

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39

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<210> 38

<211> 66

<212> DNA

<213> Hepatitis C virus

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acggac 66

<210> 39

<211> 41

<212> DNA

<213> Hepatitis C virus

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